

# The Divergent 3D Printed Car Is The Only Thing At CES That Promises A Future Worth Living In



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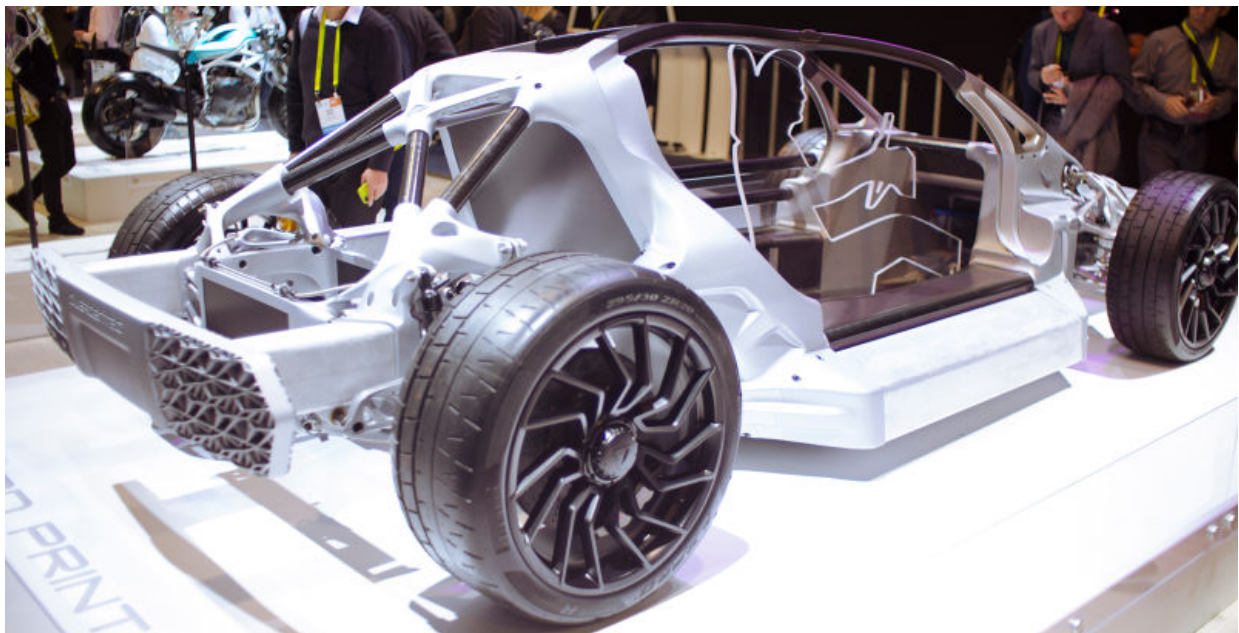


Photo Credit: Raphael Orlove

I think what's most outstanding about Divergent's 3D printed car tech is that it envisions a future that I would want to live in.

Certainly I appreciate the electric, autonomous concepts, beta prototypes and tech demonstrators that every single other carmaker trotted out to the Consumer Electronics Show this year. But the only future they offer is one where I have to work on my commute to work and more lithium gets mined out of the more remote corners of the globe.

Divergent's car is certainly disruptive, maybe the most disruptive car at the show, but it's human-driven and gasoline-powered.



Photo Credit: Raphael Orlove

Well, the actual car itself, a tandem one-door/two-seater supercar called the Blade is mostly a proof of concept. It's a badass proof of concept, sure, and it's one that tests the company's ability to put its tech on the road, but it seems like it's a very bright envelope around an incredibly cool process.

### **This Batshit Sports Car Was 3D Printed From Laser-Melted Metal**

The hype around consumer 3D printers has mostly died down, but that hasn't stopped the startup...

I've seen 3D printed cars before, but they've always been blocky and clunky, hideous and not good at being cars. I always got the feeling that companies built them just because they could; they were never lighter, cooler, better than traditionally-manufactured vehicles.

Divergent is 3D-printing their whole cars out of metal. Aluminum and titanium frames, crash structures, suspension assemblies, the whole lot. I mean, not the carbon fiber reinforcements, and not the wheels and tires, but the rest of it.

Photo Credit: Raphael Orlove

Divergent builds the car with metal powder fused by lasers. There are no steps or clunky chunks in the design as each piece is all kind of a single gigantic weld.

Photo Credit: Raphael Orlove

The technical term is 'sintering,' or 'quad-laser direct metal laser sintering' if you want to sound extra badass. It's melting the metal directly into a solid form.

And the shapes this process allows are extraordinary. They look completely organic. Making a part like the suspension assemblies with traditional means would require some kind of master technician milling out gigantic block of metal by hand. It would be nigh impossible on a basic level, utterly unfeasible as part of a production car.

Photo Credit: Raphael Orlove

I had initially thought that Divergent made their pieces like this to show off how weird they could make their parts shaped.

Photo Credit: Raphael Orlove

I was quickly corrected when I floated the idea at the show floor. Divergent stresses that these are the optimal shapes for the component's strengths and loads.

Photo Credit: Raphael Orlove

They make their parts look like this not just because they can, but because there's no lighter or stronger way to make them.

Photo Credit: Raphael Orlove

Divergent's own hardware and software evolves its car parts. It's like nature in car form. Of course they all end up looking like alien bird bones.

Divergent recently signed its first deal with a major car manufacturer, Peugeot. The deal went through, Divergent's CEO Kevin Czinger explained, after Google listed Divergent as one of its favorite companies, then urged Peugeot's CEO Carlos Tavares (the same guy who pushed Nissan into developing its colossal electric car program) to check its work out. Six months of "intensive due diligence" followed, where Peugeot basically checked all of Divergent's work. Divergent would produce a part, and both Divergent and Peugeot test it to make sure it matched expectations in tensile strength and performance.

When Peugeot finally OK'd the deal, Divergent showed Peugeot how it could take a whole 200 kilos (nearly a quarter ton) out of its family hatchback 308.

That affords not only incredible gains in fuel economy and performance, but it also simply cuts down on a lot of the steel we're trucking around the world, burning fossil fuels for production.

The weight savings came not from component versus component weights of traditional metal stamping versus 3D printing. Divergent's methodology gave them better material properties, allowed the use of better materials in better locations and allowed better optimized designs. How pieces can be fit together is totally different when its limitations are opened up by 3D printing. Divergent wasn't changing part by part; it was changing the whole system of the car. Today's cars aren't pieced together necessarily in the best way for strength or lightness; they're pieced together in the best way given the limitations of stamping out big pieces of metal. Looking at how all the pieces of Divergent's own 3D printed design gives you a sense of how differently a car can be when you remove those limitations.

Photo Credit: Raphael Orlove

I asked Czinger about the earliest days working with Peugeot. How far along was a major OEM like that in 3D printing? Were they at a kind of step one? Step zero?

“This is about a production process,” Czinger corrected me. This isn’t just about 3D printing.”

These are wonderful gains for the car world, but they’re not my favorite part about Divergent.

The thing about 3D printing cars means you don’t just have to use heavy stamped metal parts; you don’t need humongous half-mile long assembly lines to produce them. Something like a warehouse on the edge of town could house enough 3D manufacturing ability to produce an entire car.

And there’s no inflexible tooling.

“The machine doesn’t care if an hour before it was making a truck, or an hour later it’s building a supercar,” Czinger beamed.

He envisions a world where there are many more car designers, easily computer-modeling whole front ends for cars and sending the data to be materialized at a local factory.



This isn't like Henry Ford building assembly plants around the world to hammer together complete knock-down kits. This is like the kit car boom of the '50s, '60s and '70s, only without all of the limitations and cheesiness of having to use fiberglass. Divergent's future isn't sitting in traffic like today, only with the hum of gas engines replaced by electric quiet. Divergent's future is a much richer, more diverse, more flexible, and more environmental car ecosystem. So many more designs, saving so much fuel and material and waste.

Photo Credit: Raphael Orlove

Unlike half the shit I saw at CES, I desperately want to see this vision of the future come real. Peugeot is already invested in it; I hope more car companies follow.

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